Amendments to the Claims

1. (Original) A method of equalizing a received scrambled block that was transmitted through a channel, the scrambled block having a prefix, a payload, and a suffix, the method comprising the steps of:

determining a synthesized portion of a synthesized block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted, the synthetic block having a prefix, a payload, and a suffix corresponding to the prefix, the payload, and the suffix of the received scrambled block, and the synthesized portion selected from the group consisting of the prefix, the payload, and the suffix of the synthetic block;

forming the synthesized block from the synthesized portion and a portion of the received scrambled block by appending the payload and suffix of the received scrambled block to the synthesized portion to form the synthesized block if the selected synthesized portion is the prefix of the synthesized block, the suffix of the received scrambled block to the synthesized portion to form the synthesized block if the selected synthesized portion is the payload of the synthesized block, and the synthesized portion to the payload of the received scrambled block to form the synthesized block if the selected synthesized portion is the suffix of the synthesized block;

determining a discrete Fourier transform of the synthesized block to obtain a determined discrete Fourier transform;

performing a frequency domain equalization on the determined discrete Fourier transform; and

determining an inverse discrete Fourier transform of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted.

2. (Original) The method of claim 1, wherein the prefix and the suffix of the transmitted scrambled block are known.

3. (Original) The method of claim 2, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the channel response length.

4. (Original) The method of claim 3, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.

5. (Original) A method of equalizing a received scrambled block that was transmitted through a channel, the scrambled block having a prefix, a payload, and a suffix, the method comprising the steps of:

determining a synthesized prefix of a synthesized block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted;

forming the synthesized block from the synthesized prefix and the received scrambled block by replacing the prefix of the received scrambled block with the synthesized prefix;

determining a discrete Fourier transform of the synthesized block to obtain a determined discrete Fourier transform;

performing a frequency domain equalization on the determined discrete Fourier transform; and

determining an inverse discrete Fourier transform of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted.

6. (Original) The method of claim 5, wherein the prefix and the suffix of the transmitted scrambled block are known.

7. (Original) The method of claim 6, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the

channel response length.

8. (Original) The method of claim 7, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.

9. (Original) The method of claim 8, wherein the scrambled block is represented by a sequence of data symbols and the prefix of the synthetic block is determined by sending a sequence of data symbols that represents the suffix of the transmitted scrambled block followed by a sequence of data symbols that represents the prefix of the transmitted scrambled block through a model of the channel and retaining the portion of the resulting sequence corresponding to the sequence of data symbols that represents the prefix as the prefix of the synthetic block.

10. (Original) The method of claim 9, wherein the channel is modeled by an FIR filter.

11. (Original) A method of equalizing a received scrambled block that was transmitted through a channel, the scrambled block having a prefix, a payload, and a suffix, the method comprising the steps of:

determining a synthesized payload of a synthesized block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted;

forming the synthesized block from the synthesized payload and the received scrambled block by replacing the payload of the received scrambled block with the synthesized payload and removing the prefix of the received scrambled block;

determining a discrete Fourier transform of the synthesized block to obtain a determined discrete Fourier transform;

performing a frequency domain equalization on the determined discrete Fourier transform; and

determining an inverse discrete Fourier transform of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted.

12. (Original) The method of claim 11, wherein the prefix and the suffix of the transmitted scrambled block are known.

13. (Original) The method of claim 12, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the channel response length.

14. (Original) The method of claim 13, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.

15. (Original) The method of claim 14, wherein the scrambled block is represented by a sequence of data symbols and the payload of the synthetic block is determined by:

forming, data symbol by data symbol, a difference sequence, each data symbol of which is a discrete data symbol of the sequence that represents the prefix of the transmitted scrambled block subtracted from the corresponding data symbol of the sequence that represents the suffix of the transmitted scrambled block;

sending the difference sequence through a model of the channel to determine an output sequence; and

forming the payload of the synthetic block by adding, data symbol by data symbol, the output sequence to the sequence that represents the payload of the received scrambled block beginning with the first data symbol of each.

16. (Original) The method of claim 15, wherein the channel is modeled by an FIR filter.

17. (Original) A method of equalizing a received scrambled block that was transmitted through a

channel, the scrambled block having a prefix, a payload, and a suffix, the method comprising the steps of:

determining a synthesized suffix of a synthetic block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted;

forming the synthesized block from the synthesized suffix and the received scrambled block by replacing the suffix of the received scrambled block with the synthesized suffix and removing the prefix of the received scrambled block;

determining a discrete Fourier transform of the synthesized block to obtain a determined discrete Fourier transform;

performing a frequency domain equalization on the determined discrete Fourier transform; and

determining an inverse discrete Fourier transform of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted.

18. (Original) The method of claim 17, wherein the prefix and the suffix of the transmitted scrambled block are known.

19. (Original) The method of claim 18, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the channel response length.

20. (Original) The method of claim 19, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.

21. (Original) The method of claim 20, wherein the scrambled block is represented by a sequence of data symbols and the suffix of the synthetic block is determined by:

forming, data symbol by data symbol, a difference sequence, each data symbol of which is a discrete data symbol of the sequence that represents the suffix of the transmitted scrambled block subtracted from the corresponding data symbol of the sequence that represents the prefix of the transmitted scrambled block;

sending the difference sequence through a model of the channel to determine an output sequence; and

forming the suffix of the synthetic block by adding, data symbol by data symbol, the output sequence to the sequence that represents the suffix of the received scrambled block beginning with the first data symbol of each.

22. (Original) The method of claim 21, wherein the channel is modeled by an FIR filter.

23. (Original) A method of transmitting a payload through a channel to a receiver, comprising the steps of:

forming a block in which the payload is preceded in the block by a prefix and followed in the block by a suffix;

scrambling the block prior to transmission;

transmitting the scrambled block through the channel to the receiver to obtain a received scrambled block; and, at the receiver,

equalizing the received scrambled block by determining a portion of a synthetic block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted, the synthetic block having a prefix, a payload, and a suffix corresponding the prefix, the payload, and the suffix of the received scrambled block, and the synthesized portion selected from the group consisting of the prefix, the payload, and the suffix of the synthetic block, forming an intermediate block from the synthesized portion and a portion

of the received scrambled block by appending the payload and suffix of the received scrambled block to the synthesized portion to form the intermediate block if the synthesized portion is the prefix, the suffix of the received scrambled block to the synthesized portion to form the intermediate block if the synthesized portion is the payload, and the synthesized portion to the payload of the received scrambled block to form the intermediate block if the synthesized portion is the suffix, determining a discrete Fourier transform of the intermediate block to obtain a determined discrete Fourier transform, performing a frequency domain equalization on the determined discrete Fourier transform, and determining an inverse discrete Fourier transform of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted; and

unscrambling the estimate of the scrambled payload to recover the transmitted data payload.

24. (Original) A method of transmitting a payload through a channel to a receiver, comprising the steps of:

forming a block in which the payload is preceded in the block by a prefix and followed in the block by a suffix;

scrambling the block prior to transmission;

transmitting the scrambled block through the channel to the receiver to obtain a received scrambled block; and at the receiver,

equalizing the received scrambled block by determining a prefix of a synthetic block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted, forming an intermediate block from the synthesized prefix and the received scrambled block by replacing the prefix of the received scrambled block with the synthesized prefix, determining a discrete Fourier transform of the intermediate block to obtain a determined discrete Fourier transform, performing a frequency domain equalization on the determined discrete Fourier transform, and determining an inverse discrete Fourier transform of

the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted; and

unscrambling the estimate of the scrambled payload to recover the transmitted data payload.

25. (Original) A method of transmitting a payload through a channel to a receiver, comprising the steps of:

forming a block in which the payload is preceded in the block by a prefix and followed in the block by a suffix;

scrambling the block prior to transmission;

transmitting the scrambled block through the channel to the receiver to obtain a received scrambled block; and at the receiver,

equalizing the received scrambled block by determining a payload of a synthetic block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted, forming an intermediate block from the synthesized payload and the received scrambled block by replacing the payload of the received scrambled block with the synthesized payload and removing the prefix of the received scrambled block, determining a discrete Fourier transform of the intermediate block to obtain a determined discrete Fourier transform, performing a frequency domain equalization on the determined discrete Fourier transform, and determining an inverse discrete Fourier transform of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted; and

unscrambling the estimate of the scrambled payload to recover the transmitted data payload.

26. (Original) A method of transmitting a payload through a channel to a receiver, comprising the steps of:

forming a block in which the payload is preceded in the block by a prefix and followed in the block by a suffix;

scrambling the block prior to transmission;

transmitting the scrambled block through the channel to the receiver to obtain a received scrambled block; and at the receiver;

equalizing the received scrambled block by determining a suffix of a synthetic block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted, forming an intermediate block from the synthesized suffix and the received scrambled block by replacing the suffix of the received scrambled block with the synthesized suffix and removing the prefix of the received scrambled block, determining a discrete Fourier transform of the intermediate block to obtain a determined discrete Fourier transform, performing a frequency domain equalization on the determined discrete Fourier transform, and determining an inverse discrete Fourier transform of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted; and

unscrambling the estimate of the scrambled payload to recover the transmitted data payload.

27. (Currently Amended) The method of ~~any one of claims~~ claim 23 ~~–26~~, wherein the prefix and the suffix of the transmitted scrambled block are known.

28. (Original) The method of claim 27, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the channel response length.

29. (Original) The method of claim 28, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.

Claims 30-43 (Cancelled).

44. (New) The method of claim 24, wherein the prefix and the suffix of the transmitted scrambled block are known.

45. (New) The method of claim 44, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the channel response length.

46. (New) The method of claim 45, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.

47. (New) The method of claim 25, wherein the prefix and the suffix of the transmitted scrambled block are known.

48. (New) The method of claim 47, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the channel response length.

49. (New) The method of claim 48, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.

50. (New) The method of claim 26, wherein the prefix and the suffix of the transmitted scrambled block are known.

51. (New) The method of claim 50, wherein the channel has a known channel response length and the prefix and suffix of the transmitted scrambled block have lengths at least equal to the channel response length.

52. (New) The method of claim 51, wherein the prefix and suffix of the transmitted scrambled block each have the same length, which is equal to the channel response length.